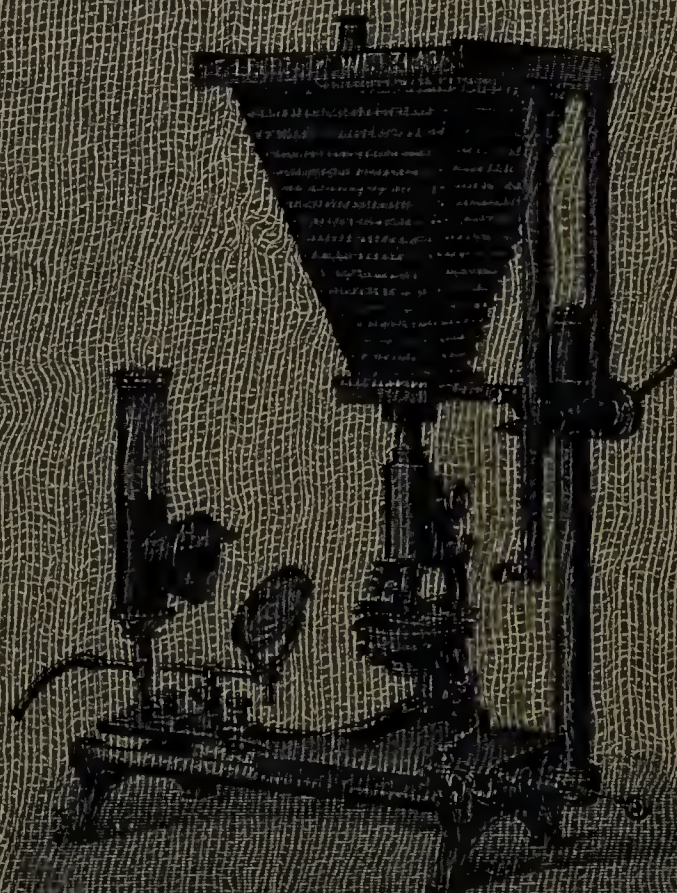


Leitz

Photo-micrographic Apparatus.



60 EAST



10th ST.

PRICE LIST No. 4

for

Catalog G

Photomicrographic Apparatus and Accessories

Page	Cat. No.	Price	Page	Cat. No.	Price
9	398	With automatic arc lamp of clock- work mechanism. \$185.00	21	Summar 100mm.	\$47.50
	399	..... 10.00		Summar 120mm.	55.00
	400	..... 4.00	22	Achromatic Objectives	
	401	..... 7.50		1*	4.00
	402	..... 15.00		1	6.50
	403	..... 2.50		1a	11.00
	404	..... 3.00		2	6.50
	405	..... 4.00		3	6.50
	406	..... 5.00		3a	8.80
	407	..... 1.00		4	11.00
	408	..... @ \$1.50 7.50		5	11.00
	409	..... 5.00		6	13.25
	411	..... 40.00		7	13.25
	412	With automatic arc lamp of clock- work mechanism. 165.00		10	35.00
	413	..... 37.50		1/12	44.00
10	414	..... 4.00	23	Fluorite Objectives	
	415	..... 7.50		6a	17.50
	417	..... 8.50		7a	17.50
	418	..... 12.50		8	20.00
	419	..... .08		8 with correction collar	26.50
16	440	..... 105.00		9	31.00
	441	..... 6.00		9 with correction collar	37.50
	442	..... 7.50		1/12a	57.00
	443	..... 7.50		1/16	69.00
	444	..... 32.50	23	Apochromatic Objectives	
	447	..... 22.50		16mm.	26.50
	Automatic arc lamp of clockwork mechanism	35.00		8mm.	35.25
	449	..... 8.50		4mm.	48.50
	450	..... 12.50		3mm.	57.25
	451	..... .08		2mm. N. A. 1.32...	77.00
20	461	..... 50.00		2mm. N. A. 1.40...	110.00
	462	..... 7.50	24	Huyghenian Eyepieces	
	463	..... 10.00		O	2.25
	464	..... 60.00		I	2.25
	465	..... 7.50		II	2.25
	466	..... 22.00		III	2.25
	Automatic arc lamp of clockwork mechanism	35.00		IV	2.25
	467	..... 8.50		V	2.25
	468	..... 12.50	24	Compensating Eyepieces	
	469	..... .08		2	5.50
21	Micro Summar 24mm..	36.00		4	5.50
	Micro Summar 35mm..	36.00		6	5.50
	Micro Summar 42mm..	36.00		8	7.75
	Summar 64mm.	40.00		12	7.75
	Summar 80mm.	44.00		18	6.50
				4 or 6 with micro- meter	8.75
			24	Projection Eyepieces	
				I	17.50
				II	17.50
				III	17.50

The manufacture of those items listed in Catalog G, but not mentioned in this price list, has been suspended until further notice.

Catalogue No. 43 G.

Photomicrographic Apparatus.

E. Leitz
Wetzlar
Germany.

Established in 1849.

Branch Offices:

30 East 18th. Street,
New-York.

320-326 Dearborn Str.,
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Luisenstrasse 45,
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St. Petersburg.

Notices and Terms.

This Catalogue supersedes all previous editions.

Instruments, when being ordered, should be described in strict accordance with the Catalogue, and complete outfits should be further identified by the prefix numbers given in each case. In telegraphic orders use should be made of the code-words appended to the prices.

All prices are strictly nett for delivery at our establishments.

Packing is charged for at cost price.

We have Branch Offices in New-York, Chicago, London, St. Petersburg, Berlin and Frankfort as well as Agencies in all University Centres.

We shall esteem it a favour if, subject to your convenience, you will kindly place your orders with our local offices and agencies.

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Preface.

Since publishing our last Catalogue of Photomicrographic Apparatus and Objectives we have materially improved and added to existing models in the light of the experience gained by an ever increasing number of workers in this branch of Science.

We have also constructed entirely new apparatus to do justice to the most recent requirements. In this connection we would draw particular attention to the new large apparatus listed with a Camera having a maximum extension of 1 metre, also to the new apparatus for taking photographs of Insects after Prof. Hermann.

As an appendix to this list will be found reproductions of actual photographs taken with our objectives and apparatus, which cannot fail to carry conviction as to their excellence.

Any of the following Catalogues will be forwarded post free on application.

1. Catalogue of **Microscopes**, No. 43 A.
2. Catalogue of **Petrological and Metallographic Microscopes**, No. 43 B.
3. Catalogue of **Dissecting Microscopes, Lens holders, and Magnifiers**, No. 43 C.
4. Catalogue of **Microscope Accessories**, No. 43 D.
5. List of **Haematological Appliances**, No. 43 E.
6. Catalogue of **Microtomes**, No. 43 F.
7. Catalogue of **Photo-micrographic Apparatus**, No. 43 G.
8. List of **Projection Apparatus and Drawing Appliances involving the principle of Projection**, No. 43 H.
9. List of **Prism Binoculars**, No. 43 J.

Electros of the illustrations contained in these catalogues are at the service of authors wishing to describe, or refer to, any of our instruments in their works or papers.

Wetzlar, January 1911.

E. Leitz.

New Large Photomicrographic Apparatus I a.

This Apparatus is characterised by its long Camera sliding upon an optical bench. The essential advantage of such a Camera consists in obtaining a large variety of magnifications with a single objective, but, in addition to this, greater depth of focus is obtained by using an objective of relatively low magnifying power with an extended bellows.

The optical bench, which is in two parts, consists of steel tubes mounted at either end and also midway upon cast iron feet the two halves being connected by a hinge arrangement. Upon these tubes can be fitted the various carriers, the curved feet of which fit the tubes exactly, any required position being maintained by means of clamping screws.

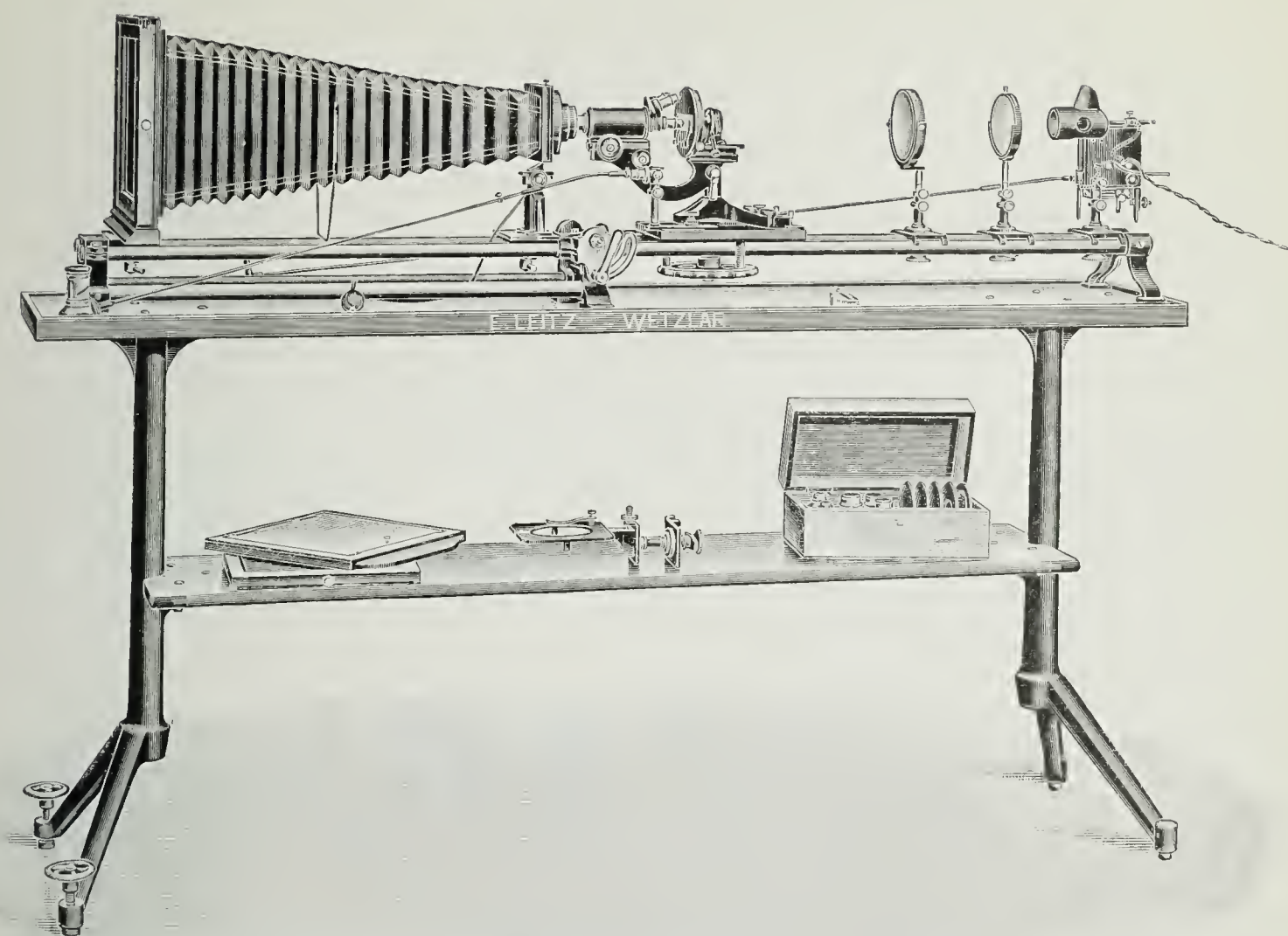
The Camera occupies one half of the optical bench resting upon two carriers, one of which holds the focussing screen, while the other carries the camera front with a portion of the light tight connection.

By means of the hinge provided the Camera can be brought into a vertical position, the apparatus may therefore be used either vertically or horizontally as required.

The Camera can be extended to any required distance up to its full length of 100 cm. (40 inches), as each carrier can be moved independently of the other. The bellows besides being very substantially made have additional wire supports, two in number, to prevent sagging when fully extended; the lower portion of the bellows is hinged to the focussing screen so that, upon the withdrawal of two bolts which keep the upper portion in position, it can be retracted in order to observe the image from the front whilst making the necessary adjustments.

Two Focussing Screens, one of ground glass and the other of clear plate glass, are supplied with the apparatus, together with two single dark slides taking plates 24 cm. square, with carriers for smaller sizes, either English or Continental.

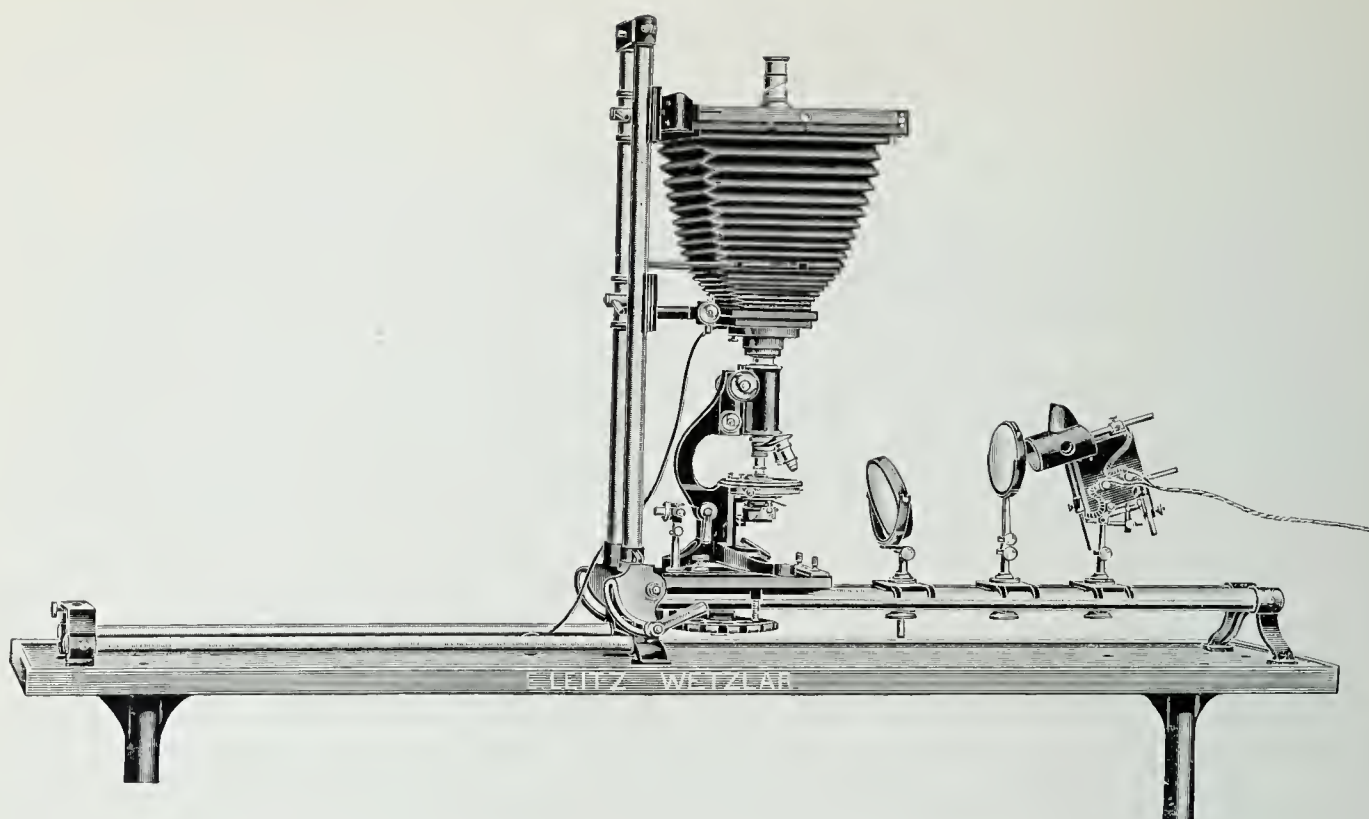
The front of the Camera is also fitted with a pneumatic shutter for time and instantaneous exposures, and the light tight connection referred to above, into which, when working with photographic lenses only, i. e. with Microsummars, without the Microscope, the adapters carrying the objectives can be pushed.



New Large Photomicrographic Apparatus Ia.
(Horizontal Position.)

The other half of the optical bench is occupied by (1) the Microscope mounted upon a sliding baseplate (2) an illuminating lens or condenser (3) a large iris diaphragm, and (4) a Liliput Arc Lamp, each of which is adjustable for height, that for the sliding baseplate carrying the microscope being controlled by a hand wheel below the level of the steel rods, this adjustment being necessary to compensate for the difference in the height of the optic axis of the various patterns of our Microscopes when placed in a horizontal position.

A special mechanism is fitted to the baseplate, which in conjunction with a lengthening rod, permits of the fine adjustment being effected whilst observing the image on the screen.



New Large Photomicrographic Apparatus Ia.
(Vertical Position)

For taking photographs of large objects with the Microsummars, without the microscope, a special vertical stage is provided mounted on a sliding carrier and fitted with a micrometer screw fine adjustment, to which the lengthening rod referred to above can also be connected should the length of the camera necessitate its use. A series of interchangeable diaphragms are supplied with the stage, the diameter of each of which corresponds approximately to the focal distance of the lens with which it is to be used, each diaphragm being provided with an illuminating lens which will illuminate uniformly and without colour the given aperture. Objectives and diaphragms are marked so that the correct pair can be rapidly selected, and the set, together with the adapters to carry the objectives to the light-tight sleeve, are packed in a case with lock.

The whole apparatus is placed upon a table of about 225 cm. (8 feet) in length, which is so constructed as to be easily taken to pieces for packing.

No.

398. **New Large Photomicrographic Apparatus Ia**, available for use both in vertical and horizontal position with Camera 1 metre (40 inches) in length, mounted upon a steel frame. One ground and one clear glass focussing screen, two single dark slides for plates 24 cm \times 24 cm, with carriers for smaller English or German sizes. Time and instantaneous shutter with pneumatic release. Base plate with vertical adjustment to suit any of our Microscopes. Large Illuminating Lens

No.		\$	Code word
	on Stand, together with two additional stands to carry the Iris Diaphragm and Source of Light. Magnifying Glass for focussing the image on the screen, and Shutter between Microscope and Camera	120.—	Miconia
399.	Iris Diaphragm to fit on Stand, with cell containing 3 glass discs, yellow, green, and white, with ground surface, for use as light filters	8.—	Mieranico
400.	Glass Tank mounted to fit Pillar Stand	3.20	Mierantho
401.	Focussing Gear to operate new fine adjustment of Stand from end of Camera	6.—	Mieraspis
402.	Stage with sliding and micrometer screw fine adjustment to carry large specimens not exceeding 100 m/m in diameter (when working with extended Camera the lengthening rod is required for focussing.)	12.—	Mieraster
403.	Diaphragm with illuminating Lens for Microsummar 24m/m	2.—	Microbal
404.	Do Do Do 35m/m	2.40	Microbio
405.	Do Do Do 42m/m	3.20	Microcarpa
406.	Do Do Do 64m/m	4.—	Microcebus
407.	Do without illuminating lens Do 80m/m	.80	Microciona
	(For the Microsummars 100 and 120 m/m the opening of the stage acts as a diaphragm; the large condenser provided with the apparatus will be found as efficient as a special lens for illuminating the microsummars 80, 100, and 120 m/m.		
	With these illuminating Lenses sharply defined images can be obtained without the use of the diaphragms, provided the diameter of the object is somewhat less than the focal length of the objective used.)		
408.	Set of 5 Adapters for the Microsummars, each engraved with the designation of the objective with which it is to be used at \$ 1.20	6.—	Microclase
409.	Wooden Case with lock for the set of Diaphragms with illuminating lenses and the 5 adapters	1.20	Microcline
410.	Liliput Arc Lamp, 4 Amp., with rack feed, centring adjustment, and extension gear by means of which the carbons can be adjusted while observing the image on the screen	18.—	Micuiere
411.	Table with iron legs, levelling screws, ball castors, and polished wood top, 225 cm (8 feet) long	32.—	Microlabls
		218.80	Micologico
	Packing	5.—	
412.	New Large Photomicrographic Apparatus Ib with Camera having an extension of 60 cm (24 inches) otherwise as above	104.—	Minurie
413.	Table with iron legs, levelling screws, ball castors, and polished wood top, 185 cm (6 feet) long	30.—	Minuetia

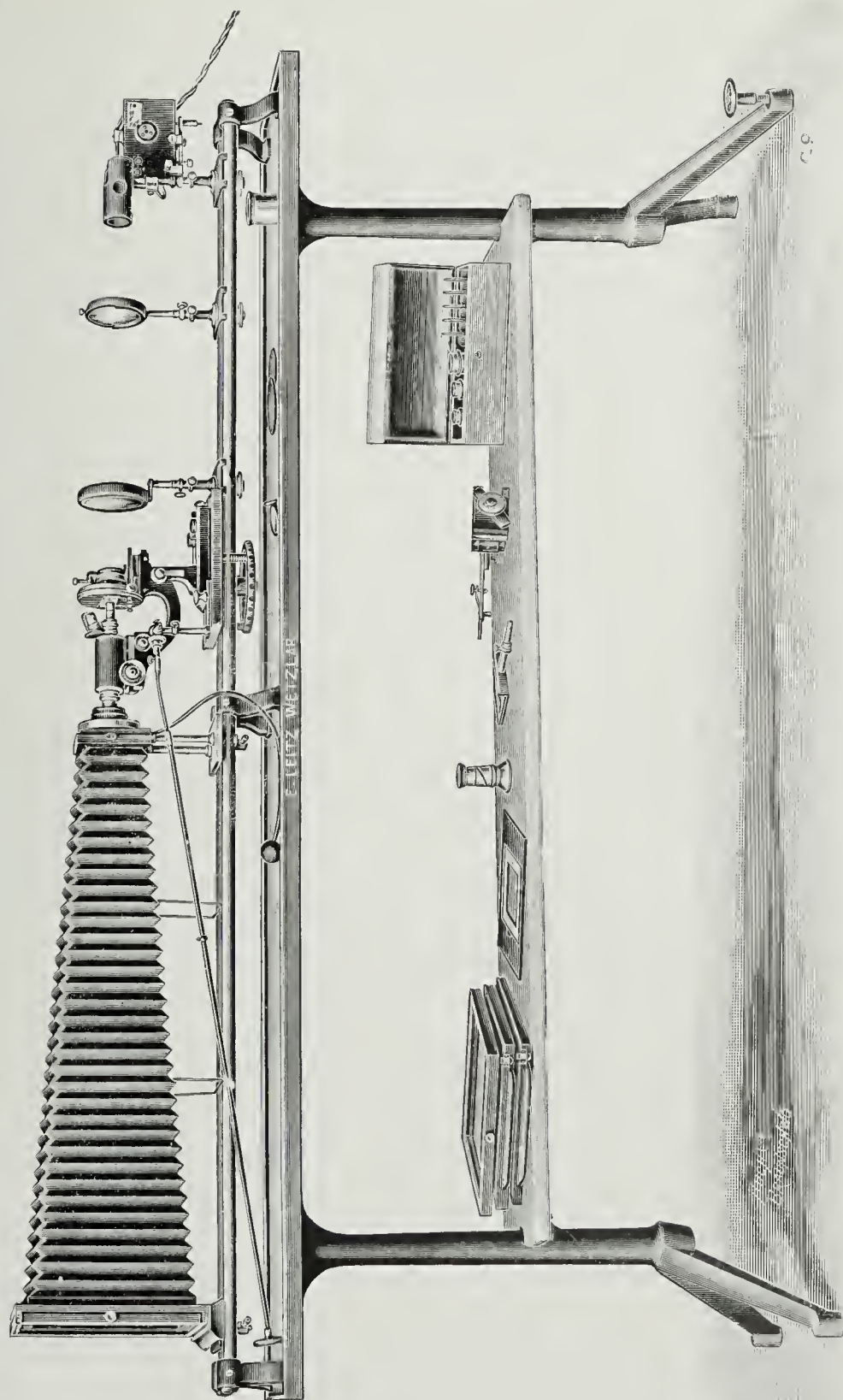
No.		\$	Code word
414.	Mechanism for actuating the fine adjustment when using a microscope with the old form of fine adjustment . . .	2.40	Micraulica
415.	Incandescent Gas Lamp , with sheet iron chimney and coloured glass discs, mounted to fit the pillar stand	6.—	Micatio
416.	Acetylene Lamp , mounted to fit the pillar stand, with separate gas generator	13.60	Micabam
	(Acetylene light should only be used when a supply of gas or electricity is not available)		
417.	Resistance for Liliput Arc Lamp, for 110 volt current	6.—	Widerstand
418.	Do. suitable for 220 volt current . . .	10.—	Widerstehe
419.	Carbons for Liliput Arc Lamp, per pair	— .06	Kohle

Large Horizontal Photomicrographic Apparatus I.

This apparatus conforms in size and equipment to that described in the preceding pages. It differs from it, however, in regard to the hinge arrangement which is omitted, consequently it can only be used in the horizontal position.

The other details given in the preceding description apply equally to this apparatus, which is carried on a similar table.

No.		\$	Code word
420.	Large Horizontal Photomicrographic Apparatus I , with Camera 1 metre (40 inches) in length, mounted upon a steel frame. One ground and one clear glass focussing screen, two single dark slides for plates 24 cm X 24 cm, with carriers for smaller English or German sizes. Time and instantaneous shutter with pneumatic release. Base plate with vertical adjustment to suit any of our Microscopes. Large Illuminating Lens on Stand, together with two additional stands to carry the Iris Diaphragm and Source of Light. Magnifying Glass for focussing the image on the screen, and shutter between Microscope and Camera	100.—	Miera
421.	Iris Diaphragm to fit on Stand, with cell containing 3 glass discs, yellow, green, and white, with ground surface, for use as light filters	8.—	Mieranico
	Carried Forward	108.—	



Large Horizontal Photomicrographic Apparatus I.

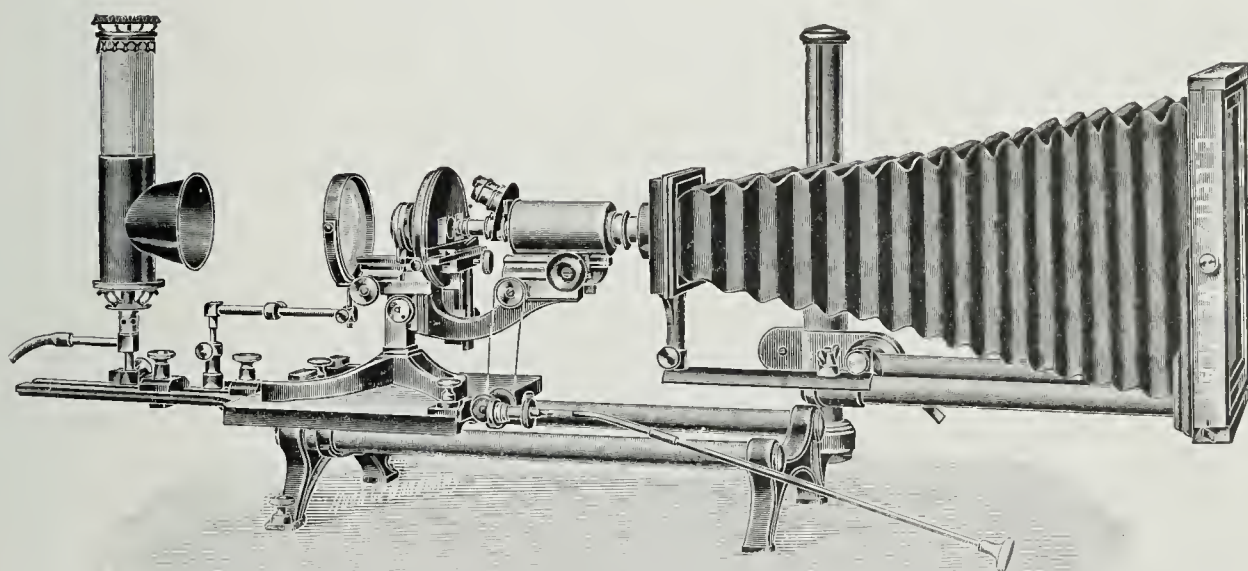
No		Brought Forward	\$	Code word
			108.—	
422.	Glass Tank mounted to fit Pillar Stand		3.20	Mierantho
423.	Focussing Gear to operate new fine adjustment of Stand from end of Camera.		6.—	Mieraspis
424.	Stage with sliding and micrometer screw fine adjustment to carry large specimens not exceeding 100 m/m in diameter (when working with extended Camera the lengthening rod is required for focussing.)		12.—	Micraster
425.	Diaphragm with illuminating Lens for Microsummar 24m/m		2.—	Microbal
426.	Do Do Do 35m/m		2.40	Microbio
427.	Do Do Do 42m/m		3.20	Microcarpa
428.	Do Do Do 64m/m		4.—	Microcebus
429.	Do without illuminating lens Do 80m/m		— .80	Microciona
	(For the Microsummars 100 and 120 m/m the opening of the stage acts as a diaphragm; the large condenser provided with the apparatus will be found as efficient as a special lens for illuminating the microsummars 80, 100, and 120 m/m.			
	With these illuminating Lenses sharply defined images can be obtained without the use of the diaphragms, provided the diameter of the object is somewhat less than the focal length of the objective used.)			
430.	Set of 5 Adapters for the Microsummars, each engraved with the designation of the objective with which it is to be used at \$	1.20	6.—	Microclase
431.	Wooden Case with lock for the set of Diaphragms with illuminating lenses and the 5 adapters		1.20	Microcline
432.	Liliput Arc Lamp, 4 Amp. with rack feed and centring adjustments, but without extension gear*)		14.—	Microcosmo
433.	Table with iron legs, levelling screws, ball castors, and polished wood top, 225 cm. (8 feet) long		32.—	Microlabis
			194.80	Micrografo
	Packing		5.—	
434.	Mechanism for actuating the fine adjustment when using a microscope with the old form of fine adjustment . .		2.40	Micraulica
435.	Incandescent Gas Lamp , with sheet iron chimney and coloured glass discs, mounted to fit the pillar stand		6.—	Micatio
436.	Acetylene Lamp , mounted to fit the pillar stand, with separate gas generator		13.60	Micabam
	(Acetylene light should only be used when a supply of gas or electricity is not available.)			
437.	Resistance for Liliput Arc Lamp, for 110 volt current		6.—	Widerstand
438.	Do. for 220 volt current . .		10.—	Widerstehe
439.	Carbons for Liliput Arc Lamp, per pair		— .06	Kohle

* If desired the lamp may be fitted with an extension gear for adjusting the carbons from end of Camera at an additional cost of \$ 4.—

Universal Photomicrographic Apparatus II.

This Apparatus can be used with the Camera in a horizontal or vertical position, it can also be used as a Studio Camera.

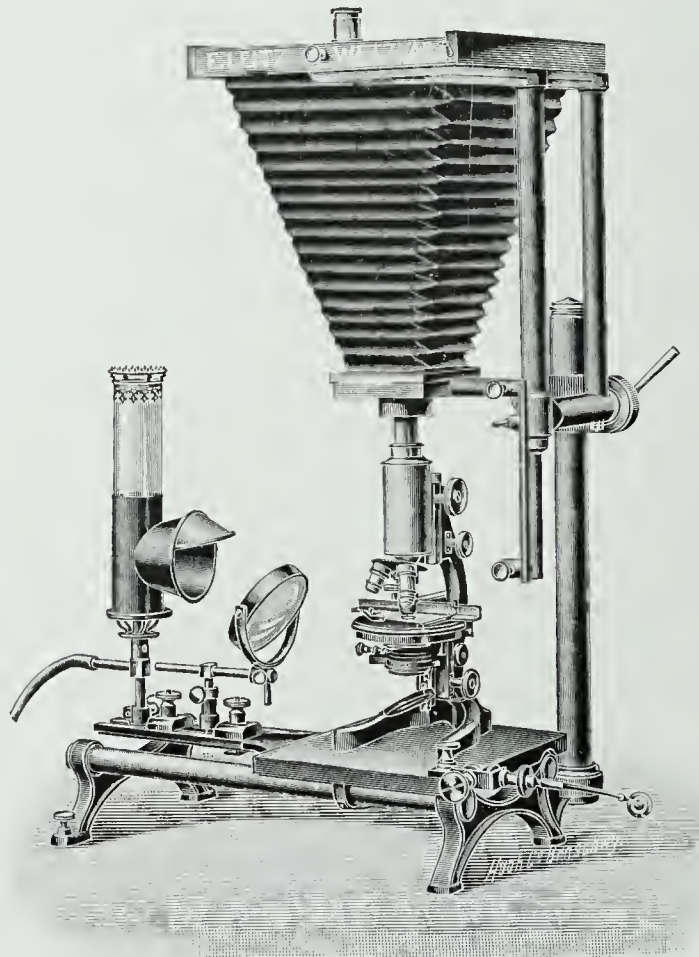
The Stand, as in the pattern previously described, consists of two parallel steel tubes mounted upon iron feet at either end, upon these tubes rests a rectangular iron plate covered with felt, which can be moved to any desired position throughout their length. The Microscope is secured to this plate by a cross bar and clamp which holds the front toes and thus fixes the instrument firmly in the horizontal position. A small Optical Bench is also screwed to the same end of the plate, upon which two separate pillars are mounted to carry the illuminating lens and the source of light.



Universal Photomicrographic Apparatus II.
(Horizontal position).

A vertical stage for large sections of which a general view is required can be fixed to the plate in various positions suited to the focal length of the objective in use. This stage is provided with three diaphragms of different sizes suitable for specimens the maximum diameter of which does not exceed 100 m/m, and is clamped firmly in position by milled headed screws.

A massive column is screwed in a vertical position to a projection on the right hand side of the stand, on which slides a fitting which can be clamped in any desired position, rotation being prevented by a keyway or groove in the column. This adjustable fitting, which carries two parallel tubes upon which the Camera is mounted, can be rotated so as to bring the Camera from the horizontal to the vertical position, at either of which positions stops are provided, it can, however, be fixed at any intermediate angle by means of a clamp controlled by a large hand wheel.



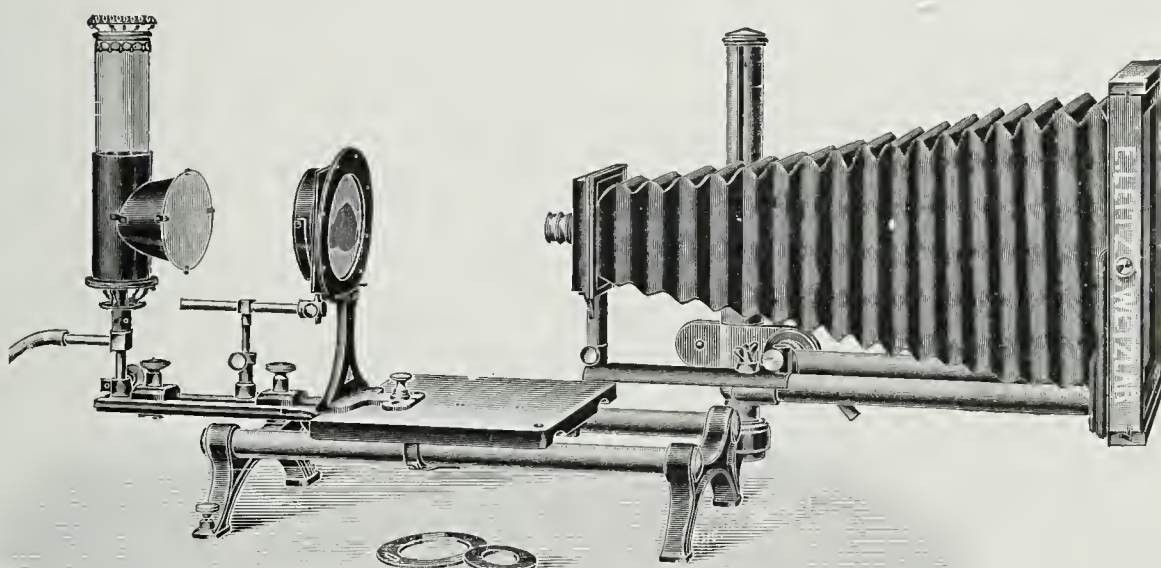
Universal Photomicrographic Apparatus II.
(Vertical position.)

Upon one of the tubes carrying the Camera slides a grooved fitting capable of fixation by a thumbscrew, at both ends of which clamping sockets are mounted so that the camera front can be readily fixed at either end. The desired camera length is thus obtained, partly by changing from one socket to the other, and partly by sliding the grooved fitting along the bar upon which the length required can be read off.

The front of the Camera is provided with rack and pinion adjustment for focussing low power objectives such as the Microsummars, which are attached directly to it.

Such objectives are first fixed to a small plate and secured by an adapter, various adapters being of course required to suit the objectives used, the plate is then inserted into a forked fitting screwed to the front of the camera in place of a similar plate carrying a sleeve, with which it is interchangeable, and which forms a light-tight connection between microscope and camera when the former is in use.

This type of apparatus has a camera extension of 50 cm. (20 inches), but a similar pattern, with an extension of 1 metre (40 inches) can be supplied to special order, for use with which it is essential to have the mechanism with lengthening rod for actuating the fine adjustment whilst observing the image on the screen; with the smaller camera although a convenience, this attachment is not absolutely essential.



Universal Photomicrographic Apparatus II.
(Arranged for photographing large Specimens.)

We recommend for use with this apparatus as an artificial illuminant either the Electric Arc (Liliput Lamp) or Incandescent Gas: the Acetylene Light can be used, but is only to be recommended when neither of the above is available.

No.

440. **Universal Photomicrographic Apparatus II**, with Camera having an extension of 50 cm. (20 inches), mounted on a steel tube stand; with ground and clear glass focussing screens; two single dark slides for plates 24×24 cm, fitted with carriers for smaller English and German sizes.

No.		\$	Code word
	Plate carrying the Microscope, suitable for any of our Stands, with Optical Bench ; Illuminating Lens ; Magnifying Glass for focussing the image on the Screen, and Exposing Shutter ,	82.—	Migrai
441.	Incandescent Gas Lamp , with sheet iron chimney and coloured glasses, green, yellow, and matt	6.—	Micatio
442.	Focussing Gear for actuating the fine adjustment of the Microscope at a distance	6.—	Mieraloe
443.	Stage with Set of Diaphragms	6.—	Mierabacia
		<hr/>	
		100.—	Migrava
	Packing	2.—	
444.	Table with iron legs, levelling screws, ball castors and polished wood top 115cm. (46 inches) long, suitable for above	26.—	Microtea
445.	Universal Photomicrographic Apparatus IIa , with Camera having an extension of 1 metre (40 inches), otherwise similarly equipped as above	120.—	Migravano
446.	Table with iron legs, levelling screws, ball castors and polished wood top 225 cm (8 feet) long, suitable for the Apparatus IIa	32.—	Microlabis
447.	Liliput Arc Lamp 4 Amp , mounted with centring adjustments to fit the pillar stand	14.—	Microcosmo
448.	Acetylene Lamp , mounted to fit the pillar stand, with separate Gas Generator (Acetylene Light should only be used when a supply of gas or electricity is not available).	13.60	Micabam
449.	Resistance for Liliput Arc Lamp , suitable for 110 Volt current	6.—	Widerstand
450.	Do. suitable for 220 Volt current	10.—	Widerstehe
451.	Carbons for Liliput Arc Lamp, per pair	—06	Kohle

Photomicrographic Apparatus III

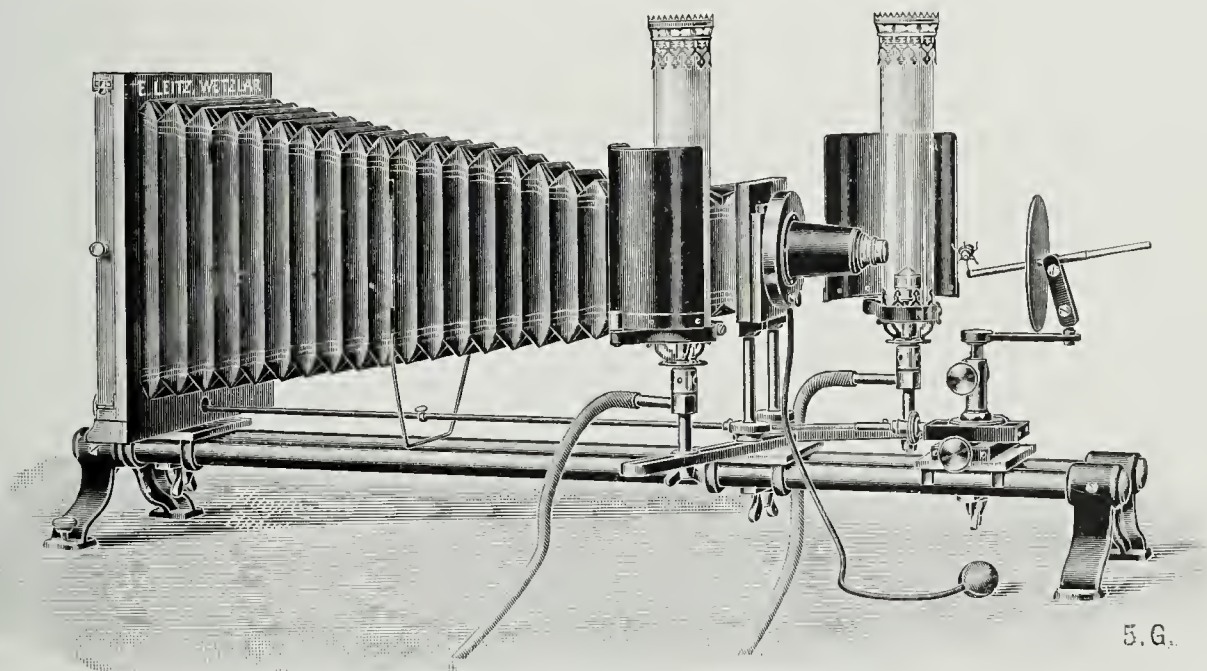
For taking photographs of Insects,
suggested by *Prof. Hermann.*

This Apparatus, which is constructed for use in the horizontal position only, is mounted on a stand similar to those previously described, consisting of two steel tubes resting upon two pairs of cast iron feet. The camera, which can be extended to 70 cm (28 inches), is mounted upon steel tubes in a similar manner to the large horizontal apparatus No. I. It has wire supports to prevent sagging, and the bellows frame can be retracted in the same manner. The front carrying the objectives is fitted with a time and instantaneous shutter.

Two Lamps (Liliput Arc, or Incandescent Gas) with condensing lenses, serve to illuminate the object.

These lamps are mounted on slotted arms attached to the pillars carrying the camera front in such a manner that not only the distance of the illuminant but also the angle of incidence of the light can be varied within wide limits, it thus becomes an easy matter to illuminate an object brightly and uniformly, or to control the density and position of the shadow required to give the necessary contrast.

The object holder consists of a base plate sliding upon the tubular base to which it can be clamped in any desired position by means of a thumb screw. It has two micrometer screw adjustments for moving the object in a horizontal plane at right angles to one another, one of which serves for lateral displacement, and the other for focussing the image on the screen. The former is especially useful when taking stereoscopic pictures, and both are provided with lengthening rods, so that the adjustments are easily effected when sitting in front of the focussing plate.



Photomicrographic Apparatus III.

For taking photographs of Insects, after *Prof. Hermann*.

For the vertical adjustment of the object a rack and pinion adjustment is provided, upon which is mounted a universal arm carrying a glass rod, the possible movements of which are well shown in the illustration, the object being fixed to the point of the rod by an adhesive, or by first mounting upon cork.

In order to render the Apparatus suitable for taking pictures by transmitted light the universal arm figured and described must

be removed from the pillar which is actuated by the rack and pinion, and replaced by a vertical stage; the illuminant (Liliput Arc or Incandescent Gas) and condenser are then mounted on a special removable optical bench behind the stage.

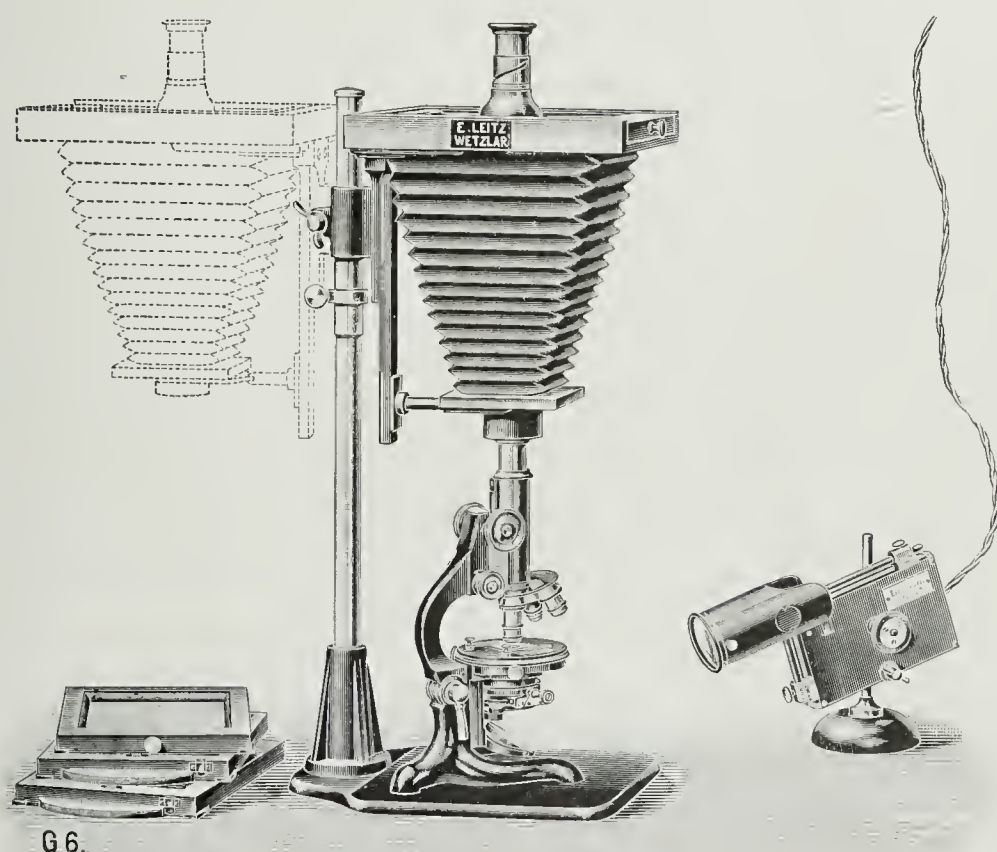
Our Microsummars will be found particularly suitable for use with this apparatus, but if higher magnifications, such as can only be obtained with a compound microscope, be required, a tube carrying objective and eyepiece can be screwed into the front of the shutter, thus dispensing with the ordinary microscope stand.

No.		\$	Code word
452.	Photomicrographic Apparatus III , for photographing insects by reflected and transmitted light, consisting of a horizontal Camera 70 cm. (28 inches) long mounted upon an optical bench; ground and clear glass focussing screens, two single dark slides for plates 24 × 24 cm, with carriers for smaller English or German sizes; time and instantaneous shutter with pneumatic release; two slotted moveable arms upon which the lamps and condensing lenses are mounted; a movable stage, adjustable in all directions, with mechanism for actuating two of the movements while observing the image on the screen: magnifying glass for focussing	72.—	Migratur
453.	Two Incandescent Gas Lamps with sheet iron chimneys	12.—	Migretis
454.	Two Illuminating Lenses 100 m/m diameter	16.—	Migueros
455.	Accessory Apparatus for use when using transmitted light , consisting of a tube screwing into the camera front, vertical stage, and small optical bench for illuminant and condensing lens	10.—	Mikado
		110.—	Migravero
	Packing	2.—	
456.	Table with iron legs, levelling screws, ball castors and polished wood top 115 cm. (46 inches) long, suitable for above apparatus	26.—	Microtea
457.	Two Liliput Arc Lamps 4 Amp. mounted with centring adjustments and condensing lenses	36.—	Migratos
458.	Resistances for Liliput Arc Lamps suitable for 110 volt current, each	6.—	Widerstand
459.	Do suitable for 220 volt current „	10.—	Widerstehe
460	Carbons for Liliput Arc Lamp, per pair	—06	Kohle

Small Photomicrographic Apparatus IV.

This Apparatus, which has a Camera extension of 25 cm. (10 inches), is designed for use in the vertical position only. It consists essentially of a rectangular base-plate of iron covered with cloth, on one side of which a vertical steel rod is mounted in a massive socket.

This rod carries the Camera, which, by means of two clamping fittings as shown in the illustration, can be fixed at any required height, and when so fixed rotated for the final adjustment of the specimen on the stage by direct observation, the return of the



Small Photomicrographic Apparatus IV.

camera to exact alignment with the optic axis of the microscope being insured by the provision of a spring catch on the camera fitting, which engages with a groove in the steel rod.

The length of the camera is adjusted by sliding the rod carrying the front up or down in the grooved fitting in which it is mounted.

A light tight connection is fitted to the front of the camera for use with the microscope, into which photographic objectives (Microsummars) can be fitted by means of the sliding adapters provided, when the microscope is dispensed with.

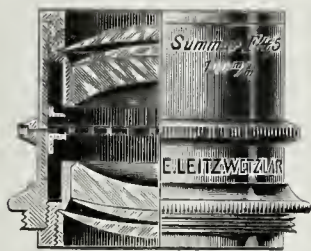
No.		\$	Code word
461.	Small Photomicrographic Apparatus IV , with vertical camera having a maximum extension of 25 cm. (10 inches); ground and clear glass focussing screens; two single dark slides for plates 18 cm by 13 cm with carriers for smaller sizes, Shutter, and Magnifier for focussing . .	40.—	Migravi
462.	Incandescent Gas Lamp , on a table stand with sheet iron chimney and 3 glass discs for use as light modifiers, ground, yellow, and green	6.—	Mikail
463.	Condensing Lens 100 m/m diameter, upon Table Stand	8.—	Illuminize
		54.—	Migravisse
	Packing	1.—	
464.	Small Photomicrographic Apparatus IVa , with vertical camera having a maximum extension of 50 cm. (20 inches), otherwise as above	62.—	Migravimus
465.	Attachment for obtaining the requisite displacement of the objective when taking stereoscopic pictures . . .	6.—	Mikion
466.	Liliput Arc Lamp 4 Amp , mounted on a table stand with condensing lens	16.—	Liliputer
467.	Resistance for Liliput Arc Lamp , suitable for 110 Volt current	6.—	Widerstand
468.	Do. suitable for 220 Volt current	10.—	Widerstehe
469.	Carbons for Liliput Arc Lamp, per pair	— .06	Kohle

Microsummars.

To obtain pictures giving a general view of large transparent specimens, or of opaque objects requiring considerable depth of focus, we would recommend our Microsummars of 24, 35, 42, 64, and 80 m/m focal length, also the Summars of 100 and 120 m/m focus, Series I.

Both Series, Microsummar and Summar, have an aperture of F/4.5, and are perfectly corrected, being free from chromatic and spherical aberration and astigmatic error.

Microsummars and Summars F/4.5 with Iris-diaphragm.



Focus mm	24	35	42	64	80	100	120
Price . . \$	24.—	24.—	24.—	28.—	30.—	34.—	40.—
Code word	Summara	Summanetis	Summanat	Summand	Summarize	Summa	Summario

Magnifications of the Microsummars and Summars F/4.5,

Distance of the focussing screen from the diaphragm of the objective in mm	Designation of Objective in mm of focus						
	120	100	80	64	42	35	24
250	1	1½	2	3	4½	6	9
500	3	4½	5½	7	11	14	20
1000	7	9	11½	15	23	28	46

The maximum diameter of the object photographed should not exceed the focal length of the objective.

Achromatic Objectives.

Designation of Objective		Focal Length (Fo)**		Numerical Aperture (N. A.)	Micrometer Values measured with Eyepiece II	Price \$	Code word
		mm	inch				
Dry Series	1*	42	1 ⁵ / ₈	0.08	0.062 mm = 62 μ	3.25*	Oakum
	1	40	1 ¹ / ₂	0.11	0.054 mm = 54 μ	6.—	Oarittis
	1a	33—24	1 ¹ / ₄ —1	0.05—0.07	0.080—0.054 mm 80—54 μ	10.— with corr. collar	Oasenos
	2	24	1	0.21	0.030 mm = 30 μ	6.—	Obarat
	3	16.2	2 ² / ₃	0.30	0.017 mm = 17 μ	6.—	Ocaleo
	3a	13.0	1 ¹ / ₂	0.40	0.013 mm = 13 μ	8.—	Ocalear
	4	10.0	2 ² / ₅	0.47	0.009 mm = 9 μ	10.—	Oderite
	5	5.4	1 ¹ / ₅	0.77	0.0054 mm = 5.4 μ	10.—	Oedipe
	6	4.0	1 ¹ / ₆	0.82	0.0037 mm = 3.7 μ	12.—	Oflite
	7	3.2	1 ¹ / ₈	0.85	0.0029 mm = 2.9 μ	12.—	Ogdoad
Water-Immersion	10	2.1	1 ¹ / ₁₂	1.20	0.0018 mm = 1.8 μ	28.—	Wateroog
Oil-immersion Lenses	1/10	2.8	1 ¹ / ₁₀	1.30	0.0026 mm = 2.6 μ	30.—	Immersit
	1/12	1.8	1 ¹ / ₁₂	1.30	0.0017 mm = 1.7 μ	40.—	Immersion

** For explanation of this term see our pamphlet: "The Microscope, and some hints on how to use it".

* The formula of objective 1* is that of a single doublet. It suffices for many purposes, though its light-transmitting power is slightly less than that of objective No. 1.

Fluorite Objectives.

Designation of Objective		Focal Length (Fo) [†] mm	Numerical aperture (N. A.)	Micrometer Values measured with Eye-piece II	Price \$	Code word
Dry-Series	6a	4.0	0.82	0.0037 mm = 3.7 μ	16.—	Ofuscar
	7a	3.2	0.85	0.0029 mm = 2.9 μ	16.—	Ogmore
	8	2.6	0.87	0.0024 mm = 2.4 μ	16.—**	Ohime
	9	2.2	0.87	0.0019 mm = 1.9 μ	28.—**	Oigamos
Oil-immersion Objectives	1/12a	1.8	1.32	0.0017 mm = 1.7 μ	52.—	Immersivo
	1/16	1.6	1.32	0.0014 mm = 1.4 μ	60.—	Immersorum

** Objectives 8 and 9 may be provided with a correction collar, which adds \$ 6.— to their cost.

Apochromatic Objectives.

Designation of Objective		Focal Length (Fo) [†] mm	Numerical Aperture (N. A.)	Micrometer Values measured with Comp. Oc. 4	Price \$	Code word
Dry Series	16mm	16	0.30	0.0160 mm	24.—	Apochabo
	8 "	8	0.65	0.0080 mm	32.—	Apochanda
	4 "	4	0.95	0.0040 mm	48.—	Apocharem
	3 "	3	0.95	0.0030 mm	52.—	Apochaturus
Oil Immersion	2 mm	2	1.32	0.0020 mm	100.—	Apochavit
	2 "	2	1.40	0.0020 mm	130.—*	Apocho

* Although, considering its very high aperture, this objective is substantially mounted yet it is advisable to exercise the greatest care in its use so as to avoid the risk of forcing in the front lens. Should this however occur we are prepared to remount the lens free of charge, provided it is otherwise undamaged.

[†] For explanation of this term, see our pamphlet: "The Microscope, and some hints on how to use it".

Huyghenian Eyepieces.

Designation	0	I	II	III	IV	V
Focal Length: (Fe) [†] mm	62.5	50.0	41.65	31.25	25.0	20.85
Eyepiece Magnificati. $\frac{250}{Fe}$ [†]	4	5	6	8	10	12
Code-word	Oculabo	Oculaire	Ocular	Oculairetur	Oculari us	Oculariter

Price, each \$ 2.—.

Compensating Eyepieces
for the Apochromatic Objectives.

Designation	2	4	6	8	12	18
Focal Length Fe [†] mm	90	45	30	22.5	15	10
Eyepiece Magnification $\frac{250^{†}}{Fe}$	2.8	5.6	8.3	11.1	16.7	25.0
Price \$	6.50	6.50	6.50	10.—	10.—	8.—
Code word	Compe	Compensa	Compensado	Compensare	Compensavi	Compensing

Compensating Eyepiece 4 or 6 with micrometer: \$ 8.50.
Code-word: Compensor Compensons

Projection Eyepieces.

Designation	I	II	III
Focus (Fe) [†] mm	90	45	22.5
Eyepiece Magnification $\frac{250^{†}}{Fe}$	2.6	6.0	10.0
Price \$	14.—	14.—	14.—
Code word	Projicare	Projicet	Projicis

[†] For explanation of these terms see our pamphlet: "The Microscope, and some hints on how to use it."

Initial Magnifications of Objectives.

Achromatic Objectives		Objective Magnifiectn. $\frac{\Delta}{\text{Fo.}}^\dagger$	Apochromatic and Fluorite objectives		Objective Magnifiectn. $\frac{\Delta}{\text{Fo.}}^\dagger$
Dry	No. 1*	2.7	Dry	Apochromat 16 mm	11.5
	" 1	3.2		" 8 "	23.0
	" 1 a	2.0—3.1		" 4 "	46.0
	" 2	5.8		" 3 "	66.0
	" 3	10.3		Fluorite No. 6 a	46.0
	" 3a	14.1		" " 7 a	58.1
	" 4	18.2		" " 8	69.1
	" 5	33.3		" " 9	85.2
	" 6	46.0			
	" 7	58.1			
Water-immersion	" 10	90.6	Homogeneous Oil Immersion	" $\frac{1}{12}$ a	100.0
Homogeneous Oil immersion	$\frac{1}{10}$	70.0		" $\frac{1}{16}$	114.0
	$\frac{1}{12}$	100.0		Apochromat 2 mm	92.0

The total magnification for any given combination of objective, eyepiece and camera extension can be obtained by multiplying the initial magnification of the objective given above by the number given in the next table representing the magnification of the eyepiece at the extension chosen.

For example: The objective 4 with the projection eyepiece II and camera extension of 400 mm will give a magnification of

$$18.2 \times 11.0 = 200$$

similarly an objective 6 with the projection eyepiece I, and a camera extension of 1000 mm, will give a magnification of:

$$46 \times 11.5 = 530.$$

† For explanation of this term, see our pamphlet: „The Microscope and some hints on how to use it“.

Magnifications of Eyepieces.

Projection, Huyghenian and Compensating
at various Camera extensions.

Extension of camera in mm			1000	800	600	500	400	300	250	200
Fe										
Projection Eyepieces	I	90	11.5	9.2	6.7	5.6	4.5	3.1	2.6	1.8
	II	45	27.5	22	16.5	13.5	11	7.5	6	4.5
	III	22.5	40	32	24	20	16	12	10	8
Huyghenian Eyepieces	0	62.5	16	13	10	8	6	5	4	3.2
	I	50	20	16	12	10	8	6	5	4
	II	41.65	24	19	14	12	10	7	6	4.8
	III	31.25	32	26	19	16	13	10	8	6.4
	IV	25	40	32	24	20	16	12	10	8
	V	20.85	48	38	29	24	19	14	12	9.6
Compen- sating Eyepieces	4	45	22	18	13	11	9	7	5.6	4.4
	6	30	34	27	20	17	13	10	8.3	6.7
	8	22.5	45	36	27	22	18	13	11.1	8.9
	12	15	67	53	40	33	27	20	16.7	13.3
	18	10	100	80	60	50	40	30	25	20

In addition to the Projection Eyepieces I, II and III which are specially constructed for Photomicrographic work, the Huyghenian Eyepieces 0, I and II will be found particularly useful.

Notes on illustrations.

The following 12 reproductions from negatives taken with the foregoing apparatus are inserted as a practical demonstration of the excellence of the results obtainable.

The prints are on Bromaryt Paper manufactured by The Neue Photographischen Gesellschaft, Berlin-Steglitz, which we can highly recommend for this class of work.

Details as to magnification, illumination, and exposure, are as follows:

No. 1. **Spirochaeta pallida.**

Magnification $\times 1000$. Objective $\frac{1}{12}$ " oil immersion, Eyepiece No 4.
Illumination — Liliput Arc-Lamp 4 amp; darkground Condenser.
Exposure — 5 seconds. Perorto plate.

No. 2. **Malaria.**

Magnification $\times 1080$. Apochromatic Objective 2 m/m oil immersion,
Compensating Ocular 8.
Illumination — Liliput Arc Lamp 4 amp; darkground Condenser; pale blue screen.
Exposure — 10 seconds. Perorto plate.

No. 3. **Trypanosoma.**

Magnification $\times 1080$. Apochromatic Objective 2 m/m oil immersion,
Compensating Ocular 8.
Illumination — Liliput Arc Lamp 4 amp; two-lens condenser, yellow-green screen.
Exposure — $1\frac{1}{2}$ minutes. Eosine-bathed plate.

No. 4. **Amphipleura pellucida.**

Magnification $\times 1150$. Apochromatic Objective 2 m/m oil immersion,
Compensating Ocular 4.
Illumination — Liliput Arc Lamp 4 amp; Aplanatic Condenser, iris diaphragm closed to 1 m/m aperture and decentred; deep blue screen.
Exposure — 6 minutes. Perorto plate.

No. 5. **Anthrax.**

Magnification $\times 1080$. Apochromatic Objective 2 m/m oil immersion
Compensating Ocular 8.
Illumination — Liliput Arc Lamp 4 amp; two-lens condenser, yellow screen.
Exposure — 1 minute. Eosine-bathed plate.

No. 6. **Meteorite.**

Magnification $\times 12$. Objective No. 1, Eyepiece 0.

Illumination — Daylight.

Exposure — 5 seconds. Perorto plate.

No. 7. **Epithelium, degeneration.**

Magnification $\times 200$. Objective No. 6, Eyepiece 0.

Illumination — Liliput Arc Lamp 4 amp; two-lens condenser, yellow screen.

Exposure — 20 seconds. Eosin-bathed plate.

No. 8. **Palao Pikrite** (Westerwald).

Magnification $\times 60$. Objective No. 3, Eyepiece 1.

Illumination — Daylight.

Exposure — 30 seconds. Perorto plate.

No. 9. **Kidney of Rabbit** (injected with Woot's metal).

Magnification $\times 2\frac{1}{2}$. Summar F/4.5, 120 m/m focal length.

Illumination — Daylight; diaphragm 96.

Exposure — 15 minutes. Perorto plate.

No. 10. **Bud of fraxinus, (transverse section).**

Magnification $\times 5\frac{1}{2}$. Microsummar 42 m/m.

Illumination — Liliput Arc Lamp 4 amp; green screen.

Exposure — 1 second. Eosine-bathed plate.

No. 11. **Philosoma.**

Magnification $\times 4$. Microsummar 24 m/m.

Illumination — Liliput Arc Lamp 4 amp; green screen.

Exposure — $1\frac{1}{4}$ seconds. Eosine-bathed plate.

No. 12. **Throat of Turtle.**

Magnification $\times 7$. Microsummar 42 m/m.

Illumination — Liliput Arc Lamp 4 amp; green screen.

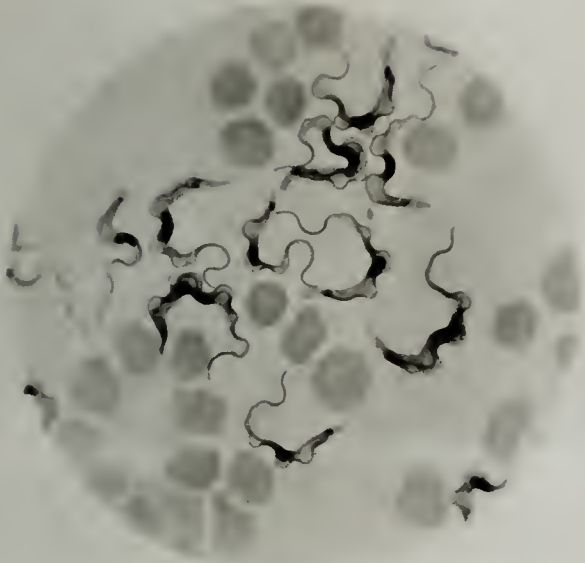
Exposure — $\frac{3}{4}$ second. Eosine-bathed plate.



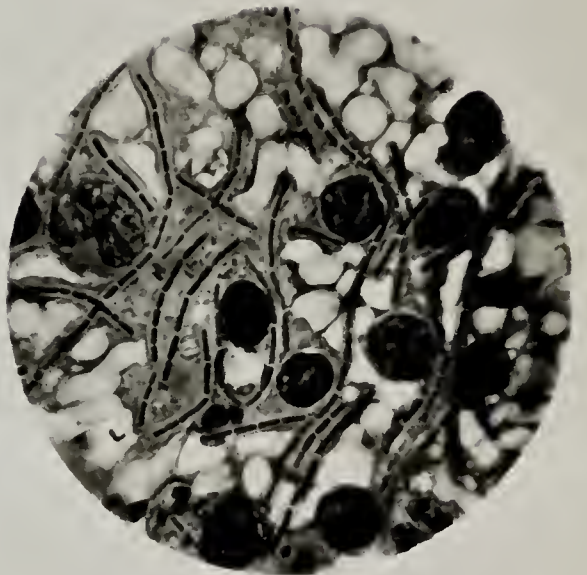
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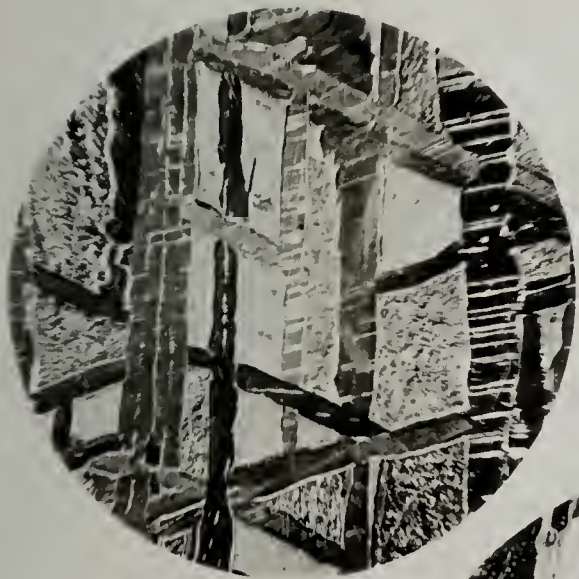
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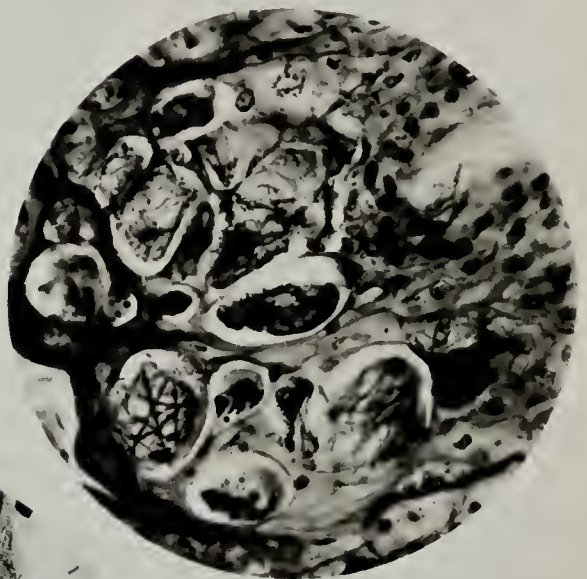
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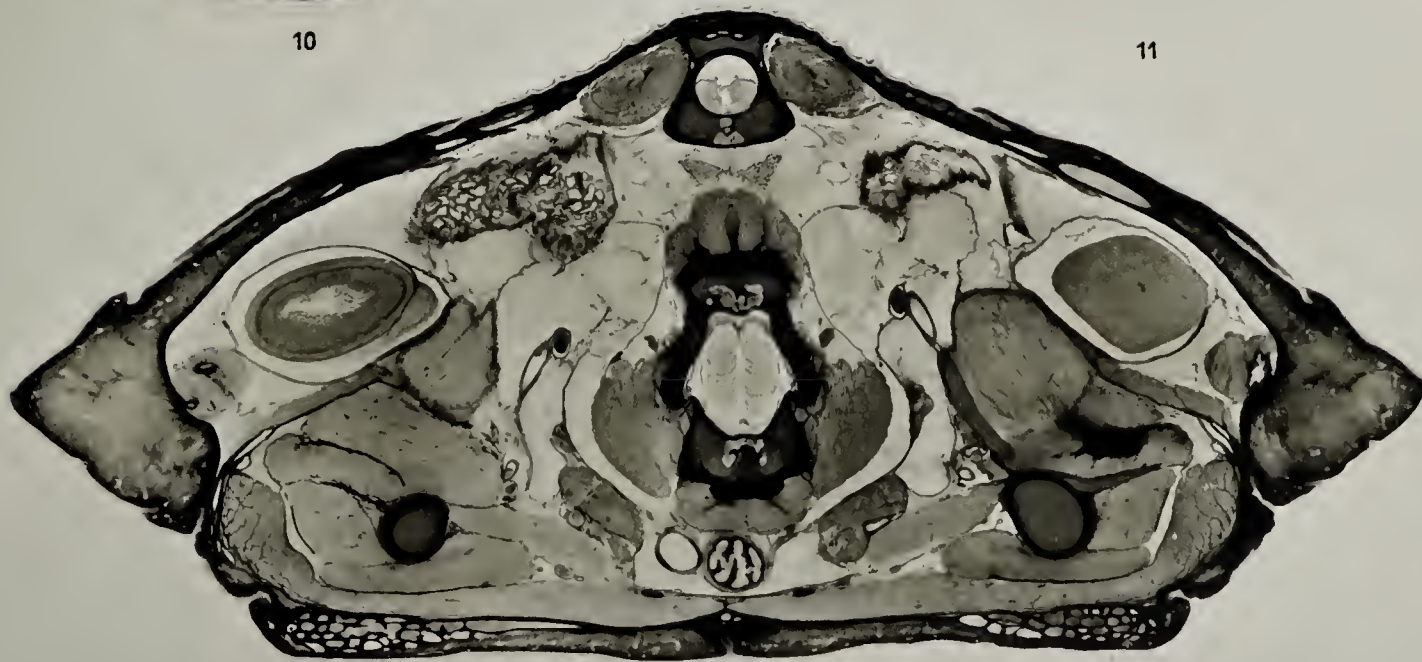
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